Claims

1. A process for producing antibodies to cholesteryl ester transfer protein (CETP) in a mammal that comprises the steps of:

(a) immunizing said mammal with an inoculum containing a vehicle in which is dissolved or dispersed a recombinant DNA molecule comprising a DNA sequence that contains (i) a sequence encoding a CETP immunogen linked to (ii) a promoter sequence that controls the expression of said CETP immunogen DNA sequence in said mammal, said CETP immunogen being an immunogenic polypeptide having a CETP amino acid residue sequence, said immunization providing an amount of said recombinant DNA molecule sufficient to induce antibodies to CETP; and

(b) maintaining said immunized mammal for a time period sufficient for the production of antibodies that bind to CETP.

2. The process of claim 1 wherein the blood of said mammal contains CETP.

3. A process for increasing the concentration of HDL cholesterol in the blood of a mammal whose blood contains cholesteryl ester transfer protein (CETP) that comprises the steps of:

(a) immunizing said mammal with an inoculum containing a vehicle in which is dissolved or dispersed a recombinant DNA molecule comprising a DNA sequence that contains (i) a sequence encoding a CETP immunogen linked to (ii) a promoter sequence that controls the expression of said CETP immunogen DNA sequence in said mammal, said CETP immunogen being an immunogenic polypeptide having a CETP amino acid residue

sequence, said immunization providing an amount of said recombinant DNA molecule sufficient to induce antibodies to CETP; and

(b) maintaining said immunized mammal for a time period sufficient for said CETP immunogen to be expressed and for the production of antibodies that bind to CETP and lessen the transfer of cholesteryl esters from HDL.

4. The process according to claim 3 wherein said immunizing step is repeated.

5. The process according to claim 3 wherein said immunizing step is repeated at intervals of about 3 to about 6 months until the HDL cholesterol value in the blood of said mammal is increased by about 10 percent or more relative to the HDL cholesterol value prior to said first immunization step.

6. The process according to claim 3 wherein said recombinant DNA molecule encodes human CETP as said immunogenic polypeptide.

7. The process according to claim 3 wherein said recombinant DNA molecule encodes rabbit CETP as said immunogenic polypeptide.

8. The process according to claim 3 wherein said encoded CETP immunogen comprises an immunogenic polypeptide fused to an exogenous antigenic carrier polypeptide.

9. The process according to claim 8 wherein said exogenous antigenic carrier polypeptide is selected

from the group consisting of hepatitis B core protein, tetanus toxoid, and diphtheria toxoid.

10. The process according to claim 9 wherein said recombinant DNA molecule encodes a fusion protein in which said exogenous antigenic carrier is fused to the carboxy-terminus of said immunogenic polypeptide.

11. The process according to claim 8 wherein the carboxy-terminus of said encoded exogenous antigenic carrier is fused to the amino-terminus of said encoded immunogenic polypeptide.

12. The process according to claim 8 wherein said encoded exogenous antigenic carrier is fused to both the amino-terminus and carboxy-terminus of said encoded immunogenic polypeptide.

13. The process according to claim 12 wherein said encoded fusion protein is comprised of an immunogenic polypeptide having a length of about 10 to about 30 amino acid residues that are fused to an amino-terminal flanking sequence and a carboxy-terminal flanking sequence, wherein

(a) said amino-terminal flanking sequence consists essentially of about 10 to about 20 amino acid residues having an amino acid residue sequence of the hepatitis B core protein (HBcAg) from about position 1 to about position 35, and said carboxy-terminal sequence consists essentially of about 120 to about 160 amino acid residues having an amino acid residue sequence of HBcAg from about position 10 about position 183, or

(b) said amino-terminal flanking sequence consists essentially of about 70 to about 90 residues

having the amino acid residue sequence of HBcAg from about position 1 to about position 90, and said carboxy-terminal flanking sequence consists essentially of about 65 to about 85 amino acid residues having the amino acid residue sequence of HBcAg from about position 80 to about position 183.

14. The process according to claim 13 wherein the number of amino acid residues present in said encoded immunogenic polypeptide is about equal in number to the number of amino acid residues absent from said HBcAg amino acid residue sequence between the carboxy-terminal residue position of said amino-terminal flanking sequence and the amino-terminal residue of said carboxy-terminal flanking sequence.

15. The process according to claim 3 wherein said encoded immunogenic polypeptide has the amino acid residue sequence of SEQ ID NOs:29 or 50.

16. The process according to claim 3 wherein said immunization is carried out by injecting said inoculum into muscle or skin of said mammal.

17. An inoculum that comprises a recombinant DNA molecule comprising a DNA sequence that contains (i) a sequence encoding a CETP immunogen linked to (ii) a promoter sequence that controls the expression of said CETP immunogen DNA sequence in a mammal, said recombinant DNA molecule being dissolved or dispersed in an effective amount in a vehicle.

18. The inoculum of claim 17 wherein the concentration of said DNA encoding said CETP immunogen is about 0.05 μg/ml to about 20 mg/ml.

19. The inoculum of claim 17 wherein said vehicle is phosphate-buffered saline.

20. The inoculum of claim 17 wherein said vehicle is isotonic sucrose.

21. The inoculum of claim 17 wherein said DNA is complexed with liposomes.